

MICHIGAN POTASH OPERATING, LLC

November 25th, 2015

Mr. Alan Batka
Class I Well Permitting
UIC Branch (WU-16J)
US EPA Region 5
77 W. Jackson Blvd
Chicago, IL 60604-3590

UIC BRANCH
EPA REGION 5

DEC 08 2015

RECEIVED

RE: Class I UIC Non-Hazardous Permit Application
REQUEST FOR REVISED P&A WELLBORES AND P&A PLAN

Sent: VIA E-MAIL and USPS Priority Tracking

Dear Mr. Batka:

Please find attached, respectfully submitted to your attention for formal review, in response made via phone correspondence on November 20th, 2015; whereby, revised plugging detail was requested regarding the MPC 1D the MPC 2D and the MPC 3D.

Please find attached,

- (1) Reverted P&A Plans, EPA Form 7520-14 for the MPC 1D, MPC 2D and MPC 3D, removing reference to perforations in the Reed City.
- (2) Revised P&A Wellbore Diagrams for the MPC 1D, MPC 2D, and MPC 3D, removing reference to perforations in the Reed City; and

Signed originals have been placed into the mail USPS via priority tracking.

Please feel free to contact me directly with comments, questions, or concerns.

Sincerely,



Theodore Pagano, P.E., P.G.
Manager
Michigan Potash Operating LLC



United States Environmental Protection Agency
Washington, DC 20460

PLUGGING AND ABANDONMENT PLAN

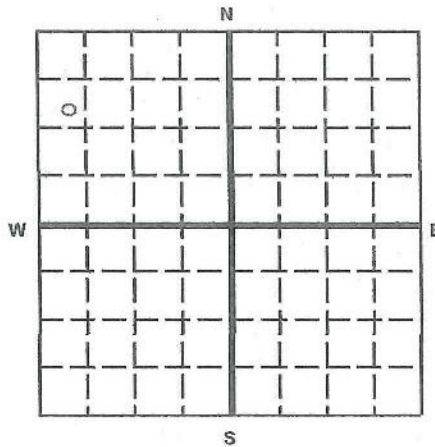
Name and Address of Facility

MPC ID

Name and Address of Owner/Operator

Michigan Potash Operating, LLC c/o Fox Rothschild
1225 17th Street, Suite 2200, Denver, CO 80215

Locate Well and Outline Unit on
Section Plat - 640 Acres



State

Michigan

County

Osceola

Permit Number

Surface Location Description

SC 1/4 of SW 1/4 of NW 1/4 of NW 1/4 of Section 31 Township 17 Range 8

Locate well in two directions from nearest lines of quarter section and drilling unit

Surface

Location ___ ft. from (N/S) N Line of quarter section 1051' FRM N

and ___ ft. from (E/W) W Line of quarter section, 376' FRM W

TYPE OF AUTHORIZATION

- ☒ Individual Permit
☐ Area Permit
☐ Rule

Number of Wells 1

WELL ACTIVITY

- ☒ CLASS I
☐ CLASS II
☒ Brine Disposal
☐ Enhanced Recovery
☐ Hydrocarbon Storage
☐ CLASS III

Lease Name

Well Number MPC ID

CASING AND TUBING RECORD AFTER PLUGGING

SIZE	WT (LB/FT)	TO BE PUT IN WELL (FT)	TO BE LEFT IN WELL (FT)	HOLE SIZE
9 5/8	36	800	800	13 3/8
7	23-28	5160	5160	8 3/4

METHOD OF EMPLACEMENT OF CEMENT PLUGS

- ☐ The Balance Method
☐ The Dump Bailer Method
☐ The Two-Plug Method
☒ Other

CEMENTING TO PLUG AND ABANDON DATA:

	PLUG #1	PLUG #2	PLUG #3	PLUG #4	PLUG #5	PLUG #6	PLUG #7
Size of Hole or Pipe in which Plug Will Be Placed (inches)	8 3/4"	7"					
Depth to Bottom of Tubing or Drill Pipe (ft. BOTTOM OF PLUG (S))	5550	5130					
Sacks of Cement To Be Used (each plug)	155	775					
Slurry Volume To Be Pumped (cu. ft.)	228	1140					
Calculated Top of Plug (ft.)	5130	0					
Measured Top of Plug (if tagged ft.)	5130	0					
Slurry Wt. (Lb./Gal.)	14.2	14.2					
Type Cement or Other Material (Class III)	A	A					

LIST ALL OPEN HOLE AND/OR PERFORATED INTERVALS AND INTERVALS WHERE CASING WILL BE VARIED (if any)

From	To	From	To
5160 Open hole	5550 Open Hole		

Estimated Cost to Plug Wells

\$ 30,400

Certification

I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Ref. 40 CFR 144.32)

Name and Official Title (Please type or print)

Theodore A. Pagano, P.E., P.G., General Manager

Signature

Date Signed

11/25/2015

MPC 1D (AMENDED NOVEMBER 2015)
SURFACE: NW/4 SEC 31, T17N R08W, 43.825947, -85.323008

VERTICAL WELL
OSCEOLA COUNTY, MI
P & A WELLBORE DIAGRAM

GL @ +/-1,124'

KB @ +/- 1137'

UPDATED NOVEMBER 25TH BY TAP

	TVD	MD
Quaternary H	0	0
Quaternary G	0	0
Quaternary F1	59	59
Quaternary F	138	138
Quaternary E	323	323
Quaternary E/1	393	393
Quaternary D	439	439
Jurassic Red Beds	513	513
Pennsylvanian		
Michigan	1205	1205
Marshall Sandstone	1653	1653
Coldwater Shale	1818	1818
Antrim Shale	2565	2565
Traverse Formation	3228	3228
Bell Shale	3802	3802
Dundee/Reed City	3858	3858
Detroit River Group	4088	4088
Amherstburg	4962	4962
Sylvania Sand Stone	5105	5105
Bois Blanc	5300	5300
Bass Islands Group	5355	5355

13 3/8" HOLE

SURFACE CASING

9-5/8" 36# J-55

SET @ 800'

Cement to Surface

320 SX 50/50 Poz and Lite, 1.47 Yield

Lowest USDW at 550', behind surface casing.

8 3/4" HOLE DRILLED TO 5,550' (5,550 TVD)

PRODUCTION CASING

7" 23-38# N-80

SET @ 5,160' MVD, TVD

DV Tool @ 3,500'

Cement from Shoe to Surface

Stage 1: 240 SX 50/50 Poz-Class A, 1.24 Yield

Stage 2: 430 SX 14.2 LITE, 1.47 Yield

Plug Cement from Retainer to Surface

775 SX Class A, Neat from Cmt Retainer to Surface
1.47 Yield

Cement Retainer @ 5,130'

Squeeze 175 SX Class A, Neat below Cmt Retainer
1.47 Yield at 130%.

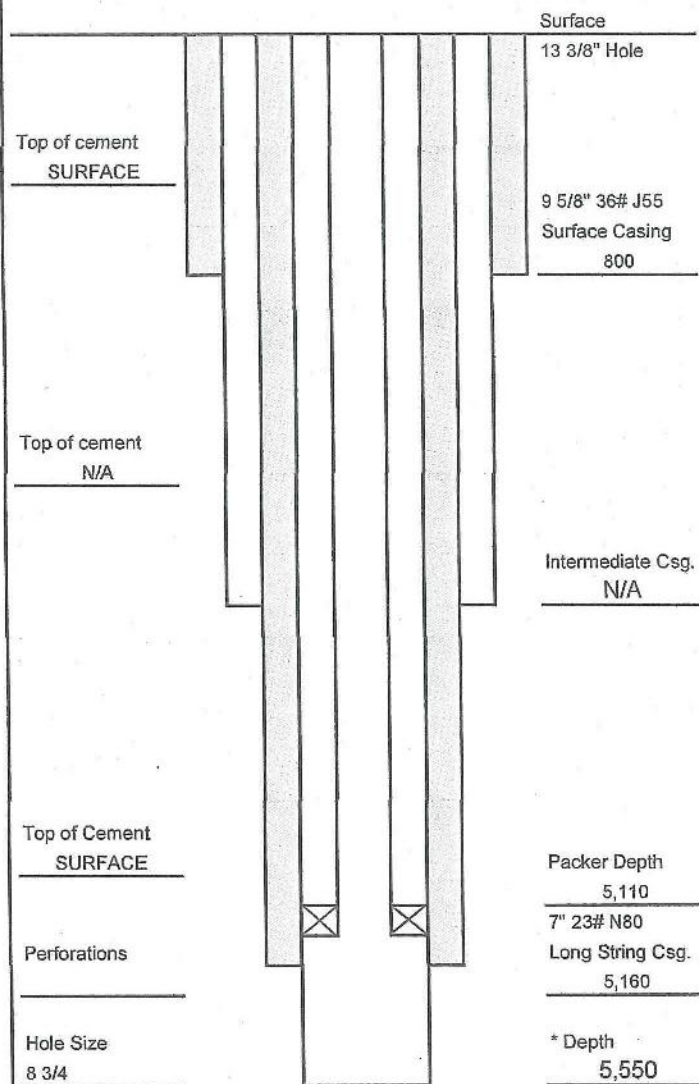
PBTD = TD

TD @ +/- 5,550'

Figure 14. P & A

ORIGINAL WELL CONSTRUCTION DURING OPERATION

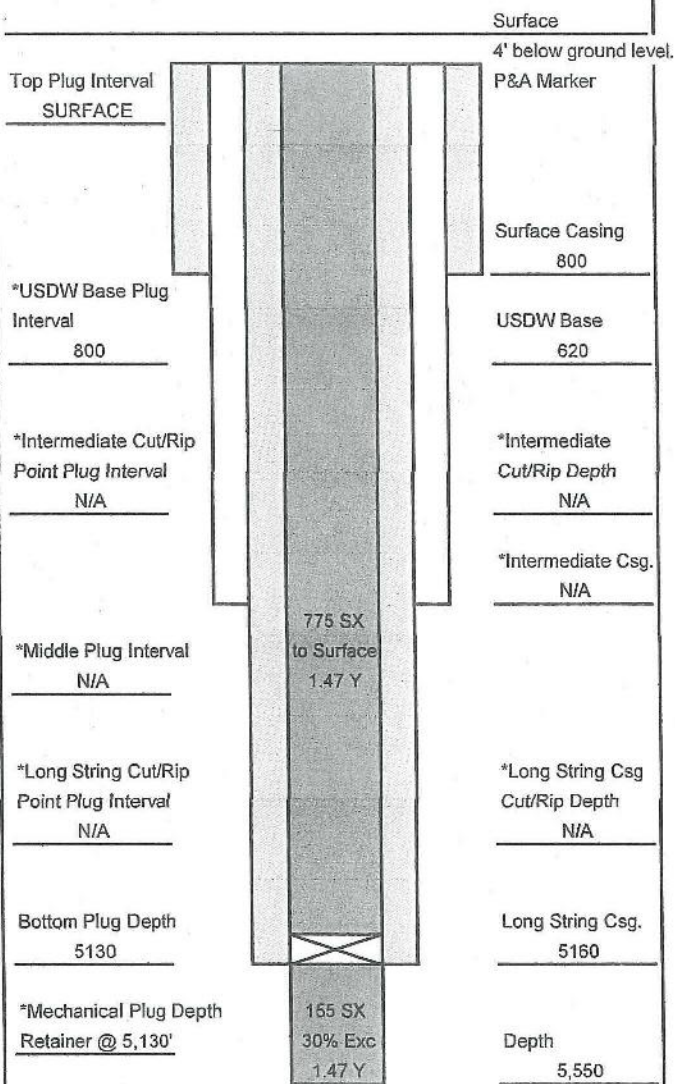
MICHIGAN POTASH INJECTION WELL
OSCEOLA COUNTY, MICHIGAN
MPC 1D (AS AMENDED NOV 2015)



** Add Any Additional Information
* May not Apply

PLUGGING AND ABANDONMENT CONSTRUCTION

MICHIGAN POTASH INJECTION WELL
OSCEOLA COUNTY, MICHIGAN
MPC 1D (AS AMENDED NOV 2015)



** Add Any Additional Information
* May not Apply

LIST OF ALL OPEN AND/OR PERFORATED INTERVALS AND INTERVALS WHERE CASING WILL BE VARIED

Specify Open Hole/ Perforations/ Varied Casing	From	To	Formation Name
9 5/8" 36# Surface Casing	0	800	Surface
7" 23# Production Casing	0	5160	Production
OPEN HOLE	5160	5550	Bass Island Dolomite, Sylvania Sand



United States Environmental Protection Agency
Washington, DC 20460

PLUGGING AND ABANDONMENT PLAN

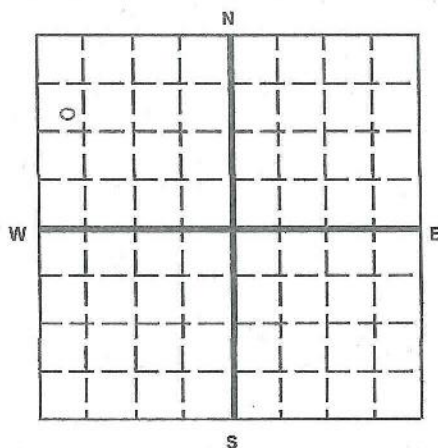
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MPC 2D

Name and Address of Owner/Operator

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Section Plat - 640 Acres



State

Michigan

County

Osceola

Permit Number

Surface Location Description

se 1/4 of SW 1/4 of NW 1/4 of NW 1/4 of Section 31, Township 17, Range 8

Locate well in two directions from nearest lines of quarter section and drilling unit

Surface

Location ___ ft. from (N/S) N Line of quarter section 1050' FRM N

and ___ ft. from (E/W) W Line of quarter section. 396' FRM W

TYPE OF AUTHORIZATION

- ☒ Individual Permit
☐ Area Permit
☐ Rule

Number of Wells 1

WELL ACTIVITY

- ☒ CLASS I
☐ CLASS II
☒ Brine Disposal
☐ Enhanced Recovery
☐ Hydrocarbon Storage
☐ CLASS III

Lease Name

Well Number MPC 2D

CASING AND TUBING RECORD AFTER PLUGGING

SIZE	WT (LB/FT)	TO BE PUT IN WELL (FT)	TO BE LEFT IN WELL (FT)	HOLE SIZE
9 5/8	36	800	800	13 3/8
7	23-28	5700	5700	8 3/4

METHOD OF EMPLACEMENT OF CEMENT PLUGS

- ☐ The Balance Method
☐ The Dump Bailer Method
☐ The Two-Plug Method
☒ Other

CEMENTING TO PLUG AND ABANDON DATA:

	PLUG #1	PLUG #2	PLUG #3	PLUG #4	PLUG #5	PLUG #6	PLUG #7
Size of Hole or Pipe in which Plug Will Be Placed (inches)	8 3/4"	7"					
Depth to Bottom of Tubing or Drill Pipe (ft) bottom of plug	5700	5590					
Sacks of Cement To Be Used (each plug)	160.00	1030					
Slurry Volume To Be Pumped (cu. ft.)	233.00	1511.00					
Calculated Top of Plug (ft.)	5590	0					
Measured Top of Plug (if tagged ft.)	5590	0					
Slurry Wt. (Lb./Gal.)	14.2	14.2					
Type Cement or Other Material (Class III)	A	A					

LIST ALL OPEN HOLE AND/OR PERFORATED INTERVALS AND INTERVALS WHERE CASING WILL BE VARIED (if any)

From	To	From	To
5185 TVD, 5700 MD open hole	5550 TVD, 6130 MD open hole		

Estimated Cost to Plug Wells

\$ 30,400

Certification

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Name and Official Title (Please type or print)

Theodore A. Pagano, P.E., P.G., General Manager

Signature

Date Signed

11/25/2015

MPC 2D (AS AMENDED NOV 2015)

SURFACE: NW/4 SEC 31, T17N R08W, 43.825948, -85.322932

BOTTOM: SW/4 SEC 30, T17N R08W, 43.832871, -85.322873

OSCEOLA COUNTY, MI

PLUGGED WELLBORE DIAGRAM

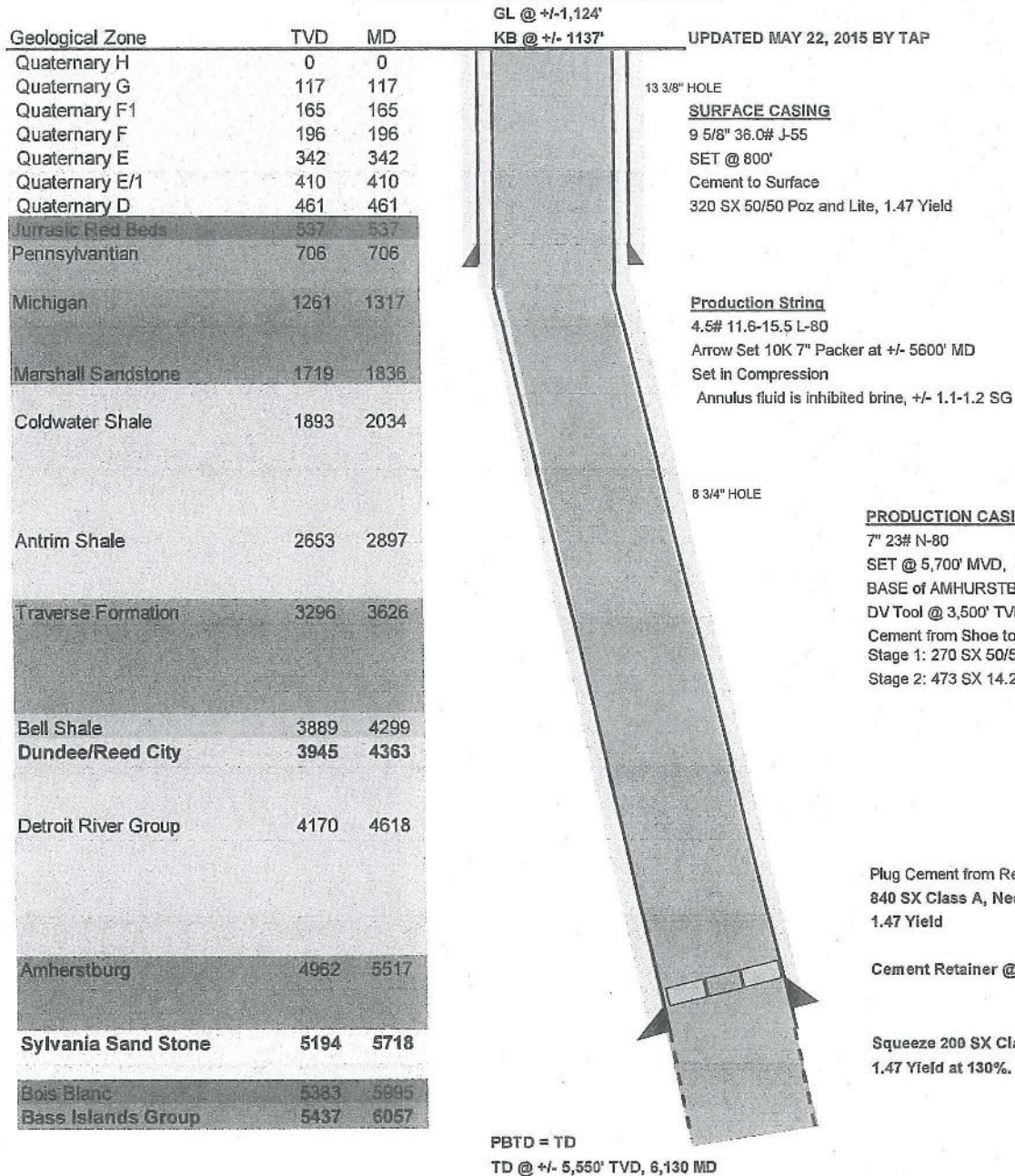
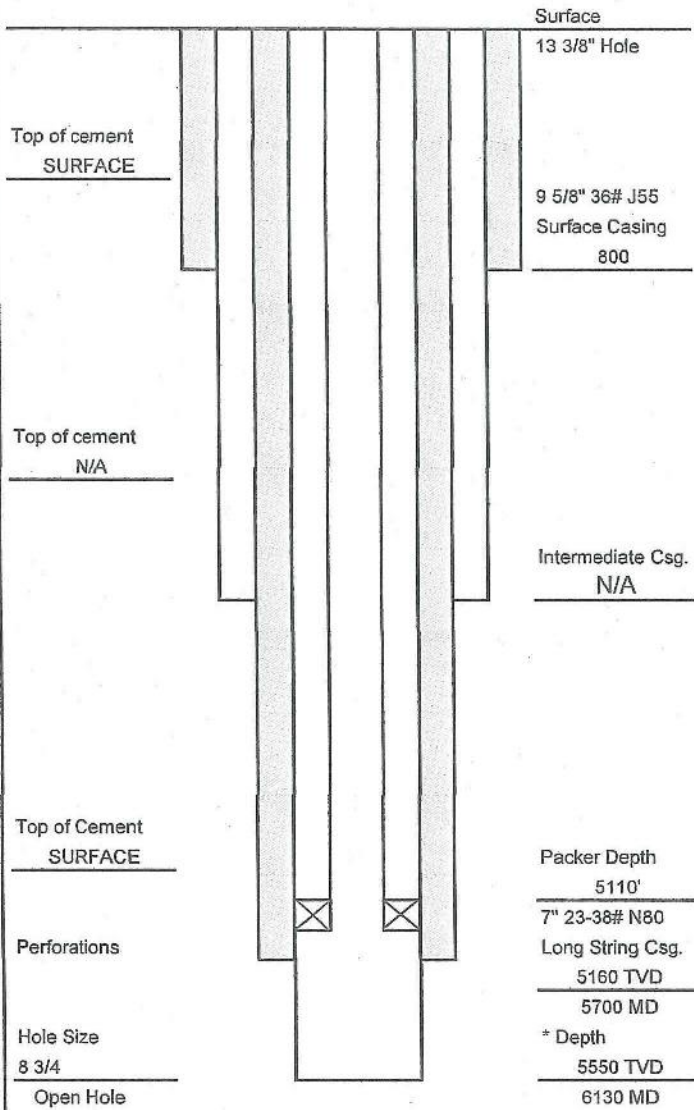


FIGURE F14. P & A.

ORIGINAL WELL CONSTRUCTION DURING OPERATION

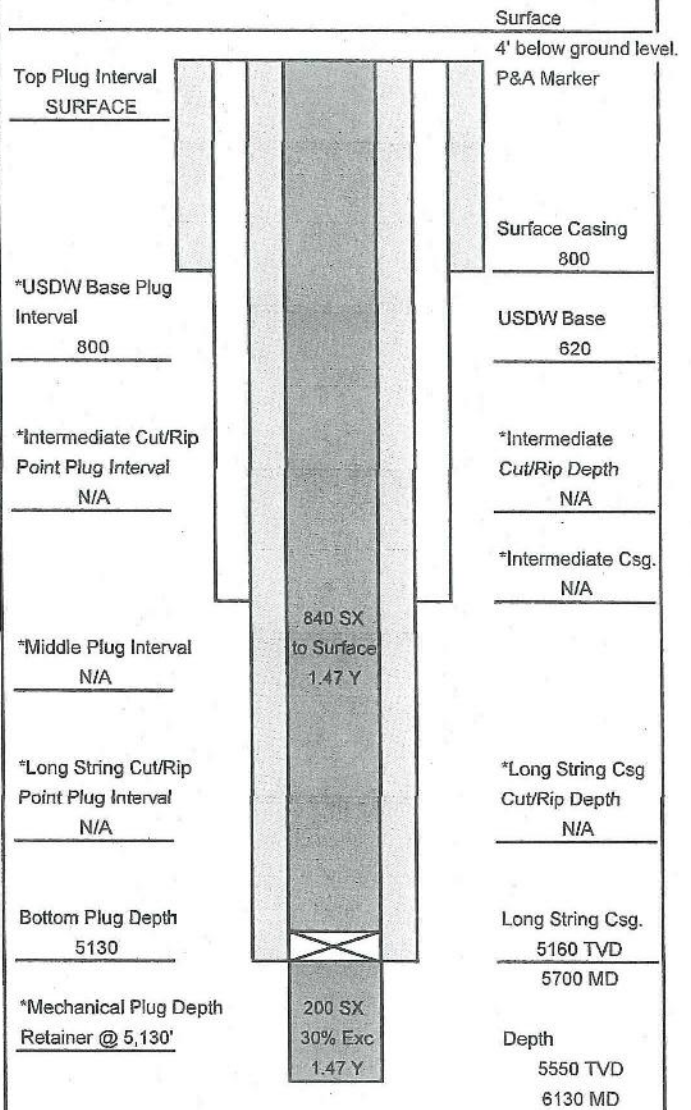
MICHIGAN POTASH INJECTION WELL
OSCEOLA COUNTY, MICHIGAN
MPC 2D (AS AMENDED NOV 2015)



** Add Any Additional Information
* May not Apply

PLUGGING AND ABANDONMENT CONSTRUCTION

MICHIGAN POTASH INJECTION WELL
OSCEOLA COUNTY, MICHIGAN
MPC 2D (AS AMENDED NOV 2015)



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LIST OF ALL OPEN AND/OR PERFORATED INTERVALS AND INTERVALS WHERE CASING WILL BE VARIED

Specify Open Hole/ Perforations/ Varied Casing	From	To	Formation Name
9 5/8" 36# Surface Casing	0	800	Surface
7" 23# Production Casing, MD	0	5700	Production
OPEN HOLE, MD	5700	6130	Bass Island Dolomite, Sylvania Sand


 United States Environmental Protection Agency
 Washington, DC 20460

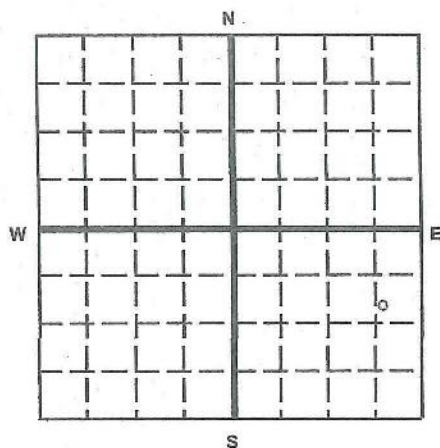
PLUGGING AND ABANDONMENT PLAN

Name and Address of Facility

MPC 3D

Name and Address of Owner/Operator

 Michigan Potash Operating, LLC c/o Fox Rothschild
 1225 17th Street, Suite 2200, Denver, CO 80215

 Locate Well and Outline Unit on
 Section Plat - 640 Acres

 State
 Michigan

 County
 Osceola

Permit Number

Surface Location Description

SW 1/4 of SE 1/4 of NE 1/4 of SE 1/4 of Section 36 Township 17 Range 9

Locate well in two directions from nearest lines of quarter section and drilling unit

Surface

Location ___ ft. from (N/S) N Line of quarter section 1168' FRM N

and ___ ft. from (E/W) E Line of quarter section. 442' FRM E

TYPE OF AUTHORIZATION

- ☒ Individual Permit
☐ Area Permit
☐ Rule

Number of Wells 1

WELL ACTIVITY

- ☒ CLASS I
☐ CLASS II
☒ Brine Disposal
☐ Enhanced Recovery
☐ Hydrocarbon Storage
☐ CLASS III

Lease Name

Well Number MPC 3D

CASING AND TUBING RECORD AFTER PLUGGING

SIZE	WT (LB/FT)	TO BE PUT IN WELL (FT)	TO BE LEFT IN WELL (FT)	HOLE SIZE
9 5/8	36	800	800	13 3/8
7	23-28	5160	5160	8 3/4

METHOD OF EMPLACEMENT OF CEMENT PLUGS

- ☐ The Balance Method
☐ The Dump Bailer Method
☐ The Two-Plug Method
☒ Other

CEMENTING TO PLUG AND ABANDON DATA:

	PLUG #1	PLUG #2	PLUG #3	PLUG #4	PLUG #5	PLUG #6	PLUG #7
Size of Hole or Pipe in which Plug Will Be Placed (inches)	8 3/4"	7"					
Depth to Bottom of Tubing or Drill Pipe (ft bottom of plug)	5550	5130					
Sacks of Cement To Be Used (each plug)	155	775					
Slurry Volume To Be Pumped (cu. ft.)	228	1140					
Calculated Top of Plug (ft.)	5130	0					
Measured Top of Plug (if tagged ft.)	5130	0					
Slurry Wt. (Lb./Gal.)	14.2	14.2					
Type Cement or Other Material (Class III)	A	A					

LIST ALL OPEN HOLE AND/OR PERFORATED INTERVALS AND INTERVALS WHERE CASING WILL BE VARIED (if any)

From	To	From	To
5160 Open Hole	5550 Open Hole		

Estimated Cost to Plug Wells

\$ 30,400

Certification

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Name and Official Title (Please type or print)

Theodore A. Pagano, P.E., P.G., General Manager

Signature

Date Signed

11/25/2015

MPC 3D
SURFACE: NE/4 SEC 36, T17N R09W, 43.818448, - 85.326073
VERTICAL WELL
OSCEOLA COUNTY, MI

PLUGGED WELLBORE DIAGRAM

GL @ +/-1,190'

KB @ +/- 2003'

UPDATED MAY 22ND 2015 BY TAP

	TVD	MD
Quaternary H	0	0
Quaternary G	0	0
Quaternary F1	59	59
Quaternary F	138	138
Quaternary E	323	323
Quaternary E/1	393	393
Quaternary D	439	439
Jurassic Red Beds	513	513
Pennsylvanian		
Michigan	1205	1205
Marshall Sandstone	1653	1653
Coldwater Shale	1818	1818
Antrim Shale	2565	2565
Traverse Formation	3228	3228
Bell Shale	3802	3802
Dundee/Reed City	3858	3858
Detroit River Group	4088	4088
Amherstburg	4962	4962
Sylvania Sand Stone	5105	5105
Bois Blanc	5300	5300
Bass Islands Group	5355	5355

13 3/8" HOLE

SURFACE CASING

9-5/8" 36# J-55

SET @ 800'

Cement to Surface

320 SX 50/50 Poz and Lite, 1.47 Yield

Lowest USDW at 550', behind surface casing.

8 3/4" HOLE DRILLED TO 5,550' (5,550 TVD)

PRODUCTION CASING

7" 23# N-80

SET @ 5,160' MVD, TVD

DV Tool @ 3,500'

Cement from Shoe to Surface

Stage 1: 240 SX 50/50 Poz-Class A, 1.24 Yield

Stage 2: 430 SX 14.2 LITE, 1.47 Yield

Plug Cement from Retainer to Surface

775 SX Class A, Neat from Cmt Retainer to Surface
1.47 Yield

Cement Retainer @ 5,130'

Squeeze 175 SX Class A, Neat below Cmt Retainer
1.47 Yield at 130%.

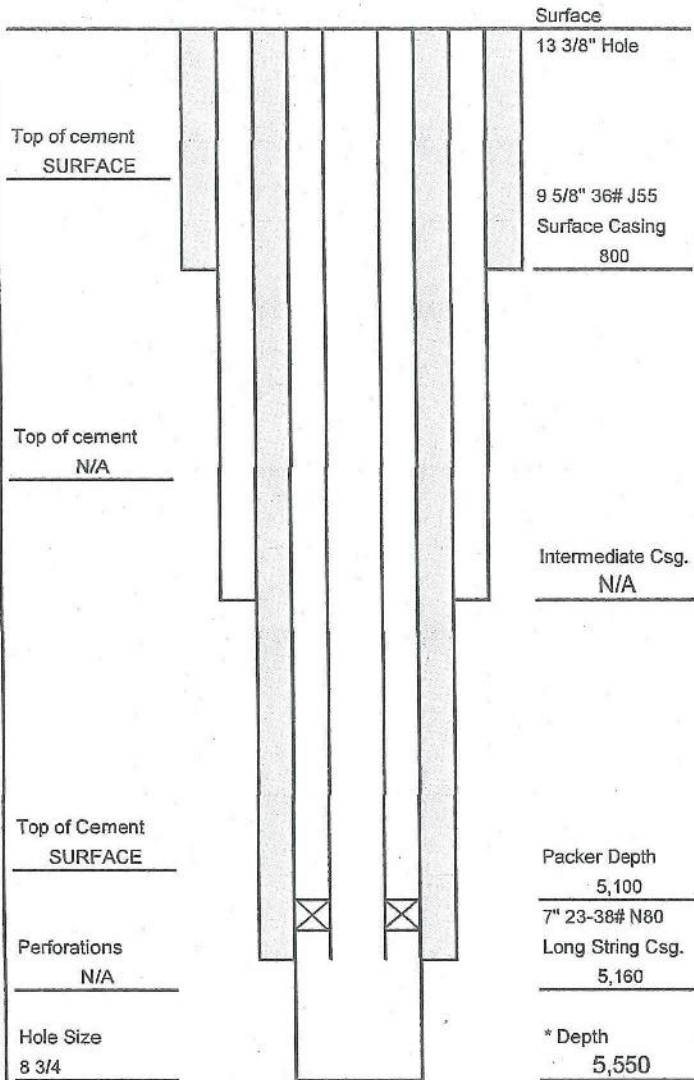
PBTD = TD

TD @ +/- 5,550'

Figure 14. P & A

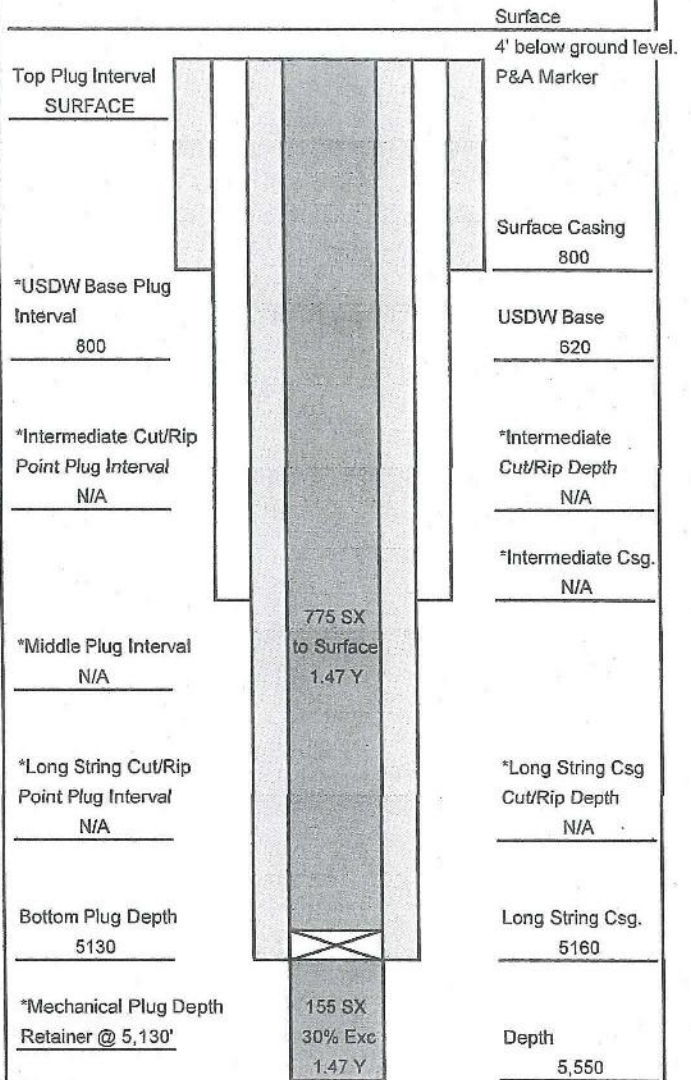
ORIGINAL WELL CONSTRUCTION DURING OPERATION

MICHIGAN POTASH INJECTION WELL
OSCEOLA COUNTY, MICHIGAN
MPC 3D (AS AMENDED NOV 2015)



PLUGGING AND ABANDONMENT CONSTRUCTION

MICHIGAN POTASH INJECTION WELL
OSCEOLA COUNTY, MICHIGAN
MPC 3D (AS AMENDED NOV 2015)



** Add Any Additional Information
* May not Apply

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Specify Open Hole/ Perforations/ Varied Casing	From	To	Formation Name
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OPEN HOLE	5160	5550	Bass Island Dolomite, Sylvania Sand



United States Environmental Protection Agency
Washington, DC 20460

PLUGGING AND ABANDONMENT PLAN

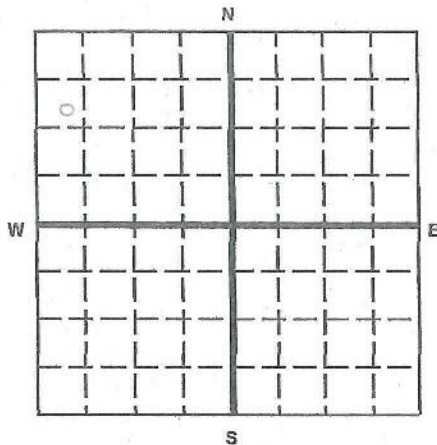
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Name and Address of Owner/Operator

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Locate Well and Outline Unit on
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State
Michigan

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Osceola

Permit Number

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SC 1/4 of SW 1/4 of NW 1/4 of NW 1/4 of Section 31 Township 17 Range 8

Locate well in two directions from nearest lines of quarter section and drilling unit

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and ____ ft. from (E/W) W Line of quarter section. 376' FRM W

TYPE OF AUTHORIZATION

- ☒ Individual Permit
☐ Area Permit
☐ Rule

Number of Wells 1

WELL ACTIVITY

- ☒ CLASS I
☐ CLASS II
☒ Brine Disposal
☐ Enhanced Recovery
☐ Hydrocarbon Storage
☐ CLASS III

Lease Name

Well Number MPC 1D

CASING AND TUBING RECORD AFTER PLUGGING

SIZE	WT (LB/FT)	TO BE PUT IN WELL (FT)	TO BE LEFT IN WELL (FT)	HOLE SIZE
9 5/8	36	800	800	13 3/8
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From	To	From	To
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Estimated Cost to Plug Wells

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Signature

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Washington, DC 20460

PLUGGING AND ABANDONMENT PLAN

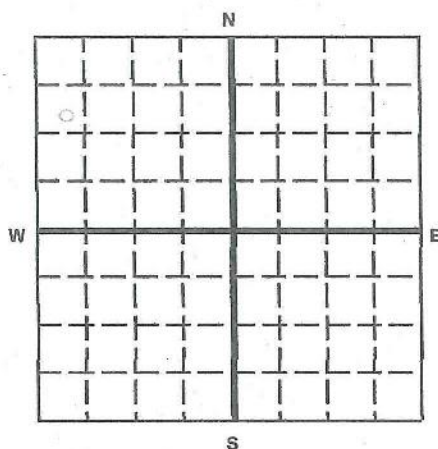
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WELL ACTIVITY

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☐ CLASS II
☒ Brine Disposal
☐ Enhanced Recovery
☐ Hydrocarbon Storage
☐ CLASS III

Lease Name

Well Number MPC 2D

CASING AND TUBING RECORD AFTER PLUGGING

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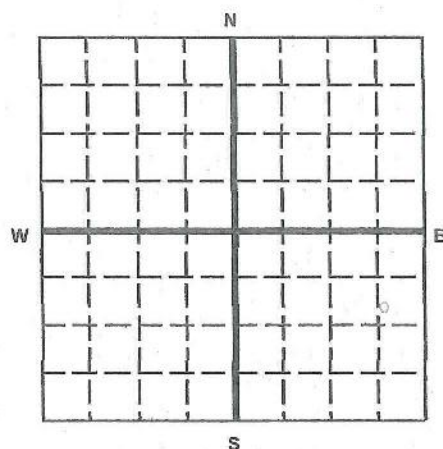
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Michigan

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Osceola

Permit Number

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Locate well in two directions from nearest lines of quarter section and drilling unit

Surface

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and ___ ft. from (E/W) E Line of quarter section. 442' FRM E

TYPE OF AUTHORIZATION

- ☒ Individual Permit
☐ Area Permit
☐ Rule

Number of Wells 1

Lease Name

WELL ACTIVITY

- ☒ CLASS I
☐ CLASS II
☒ Brine Disposal
☐ Enhanced Recovery
☐ Hydrocarbon Storage
☐ CLASS III

Well Number MPC 3D

CASING AND TUBING RECORD AFTER PLUGGING

METHOD OF EMPLACEMENT OF CEMENT PLUGS

SIZE	WT (LB/FT)	TO BE PUT IN WELL (FT)	TO BE LEFT IN WELL (FT)	HOLE SIZE
9 5/8	36	800	800	13 3/8
7	23-28	5160	5160	8 3/4

- ☐ The Balance Method
☐ The Dump Bailer Method
☐ The Two-Plug Method
☒ Other

CEMENTING TO PLUG AND ABANDON DATA:

	PLUG #1	PLUG #2	PLUG #3	PLUG #4	PLUG #5	PLUG #6	PLUG #7
Size of Hole or Pipe in which Plug Will Be Placed (inches)	8 3/4"	7"					
Depth to Bottom of Tubing or Drill Pipe (ft bottom of plug)	5550	5130					
Sacks of Cement To Be Used (each plug)	155	775					
Slurry Volume To Be Pumped (cu. ft.)	228	1140					
Calculated Top of Plug (ft.)	5130	0					
Measured Top of Plug (if tagged ft.)	5130	0					
Slurry Wt. (Lb./Gal.)	14.2	14.2					
Type Cement or Other Material (Class III)	A	A					

LIST ALL OPEN HOLE AND/OR PERFORATED INTERVALS AND INTERVALS WHERE CASING WILL BE VARIED (if any)

From	To	From	To
5160 Open Hole	5550 Open Hole		

Estimated Cost to Plug Wells

\$ 30,400

Certification

I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Ref. 40 CFR 144.32)

Name and Official Title (Please type or print)

Theodore A. Pagano, P.E., P.G., General Manager

Signature

Date Signed

11/25/2015